



Deep Learning

« The man when the computer dream »

Introduction

- Google research blog
 - Publication of the June 17, 2015
 - Going deeper into neural networks

Plan

- Some definitions
- Actual use
- Artistic part

Définition 1/2

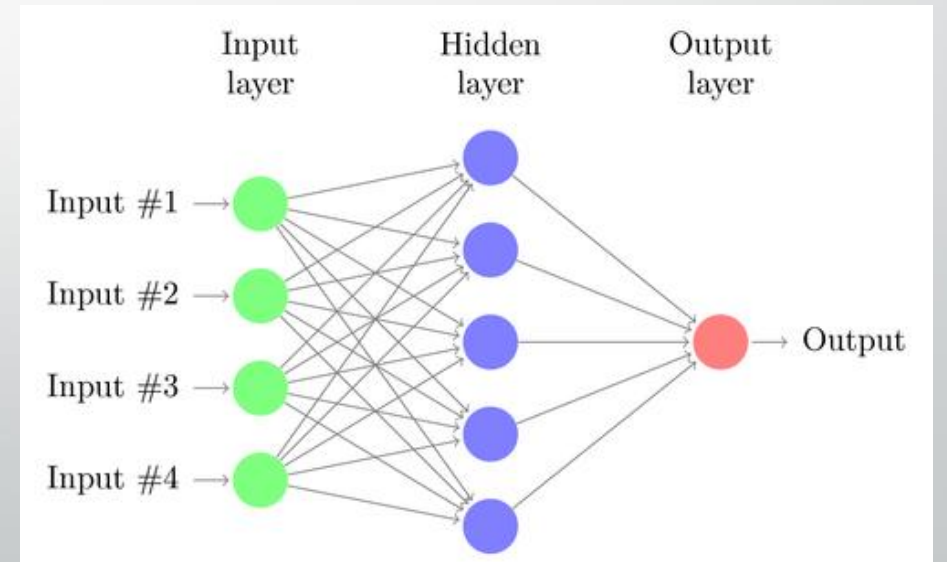
- Machine Learning :
 - Take a lot of Data
 - Take Big algorithm
 - Group twice
- Two parts :
 - Teach Parts (show the way to the algorithm)
 - Automated Parts

A special way to solve problem without understand them

Definition 2/2

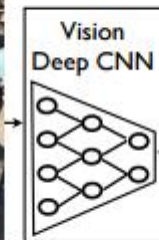
- Deep Learning
 - A class of Machine Learning (Supervised algorithm)
 - Supervised = system will learn to classify
 - Composed of neural network
 - 1 = good result
 - 0 = bad result
 - $]0;1[$ = not enough precise

Example of neural network

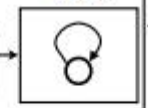


Actual Use 1/3

- With deep learning you can :
 - Describe picture
 - Classify people
 - ... etc



Language
Generating
RNN



**A group of people
shopping at an
outdoor market.**

**There are many
vegetables at the
fruit stand.**

Actual Use 2/3

A person riding a motorcycle on a dirt road.



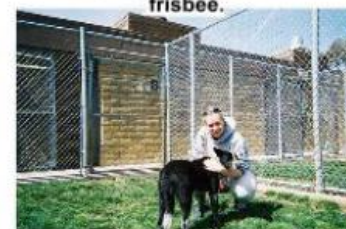
Two dogs play in the grass.



A skateboarder does a trick on a ramp.



A dog is jumping to catch a frisbee.



A group of young people playing a game of frisbee.



Two hockey players are fighting over the puck.



A little girl in a pink hat is blowing bubbles.



A refrigerator filled with lots of food and drinks.



A herd of elephants walking across a dry grass field.



A close up of a cat laying on a couch.



A red motorcycle parked on the side of the road.



A yellow school bus parked in a parking lot.



Describes without errors

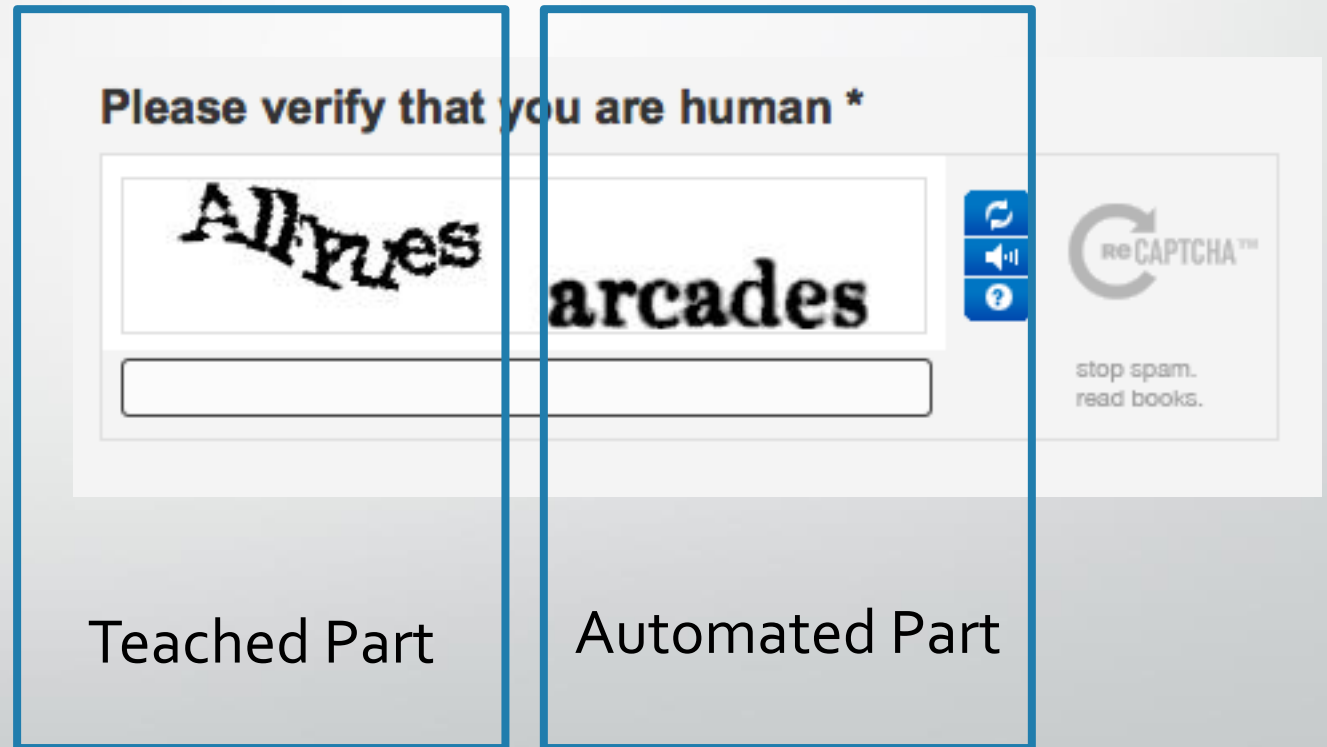
Describes with minor errors

Somewhat related to the image

Unrelated to the image

Actual Use 3/3

- Captcha



Artistic Part 1/2



Starry Night,
Vincent Van
Gogh

Artistic Part 2/2



+

- A large Databases of Images
- A sorting algorithm

Conclusion

- Artificial Intelligence = danger for man ?

Sources/Bibliography

- <http://googleresearch.blogspot.fr/2015/06/inceptionism-going-deeper-into-neural.html>
- <http://www.texample.net/tikz/examples/neural-network/>
- <http://thecreatorsproject.vice.com/blog/what-do-computers-dream-of-when-they-look-at-art>
- <http://arxiv.org/pdf/1411.4555v1.pdf>



Questions ?

To go further

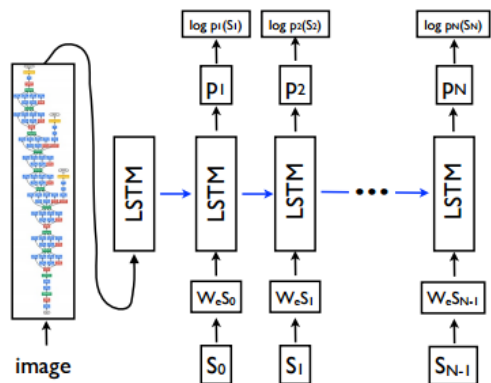


Figure 3. LSTM model combined with a CNN image embedder (as defined in [30]) and word embeddings. The unrolled connections between the LSTM memories are in blue and they correspond to the recurrent connections in Figure 2. All LSTMs share the same parameters.

Long short Term Memory

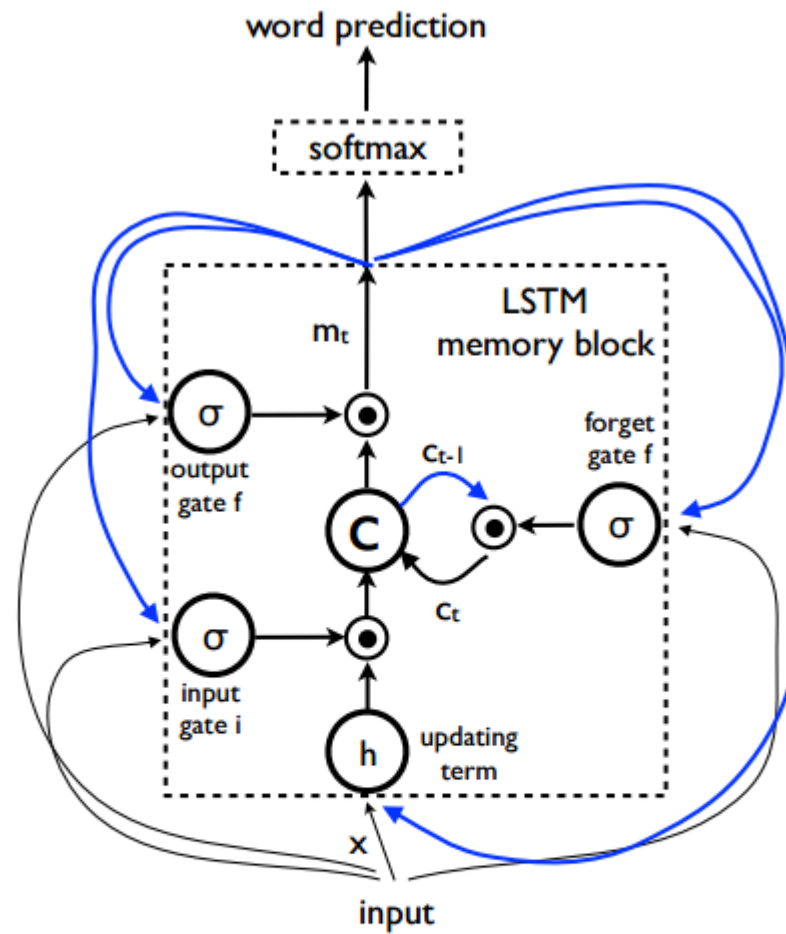


Figure 2. LSTM: the memory block contains a cell c which is controlled by three gates. In blue we show the recurrent connections – the output m at time $t - 1$ is fed back to the memory at time t via the three gates; the cell value is fed back via the forget gate; the predicted word at time $t - 1$ is fed back in addition to the memory output m at time t into the Softmax for word prediction.

Few more pictures



The Persistence of Memory, Salvador Dalí

Few more pictures



The Son of Man, René Magritte

Few more pictures



The Last Supper, Leonardo DaVinci

Few more pictures



The Birth of Venus, Sandro Botticelli

Find more

- <https://www.deepdreamit.com>